

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification: H01L	A2	(11) International Publication Number: WO 99/53529 (43) International Publication Date: 21 October 1999 (21.10.99)
(21) International Application Number: PCT/US99/07970 (22) International Filing Date: 12 April 1999 (12.04.99) (30) Priority Data: 60/081,492 13 April 1998 (13.04.98) US (71) Applicant (for all designated States except US): TRUSTEES OF PRINCETON UNIVERSITY [US/US]; P.O. Box 36, Princeton, NJ 08544-0036 (US). (72) Inventors; and (75) Inventors/Applicants (for US only): STURM, James, C. [US/US]; 3R Magie Apartment, Faculty Road, Princeton, NJ 08540 (US). HEBNER, Thomas, R. [US/US]; 214G Halsey Street, Princeton, NJ 08540 (US). (74) Agent: FRISCIA, Michael, R.; Friscia & Nussbaum, One University Plaza, Hackensack, NJ 07601 (US).		(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>Without international search report and to be republished upon receipt of that report.</i>
(54) Title: MODIFICATION OF POLYMER OPTOELECTRONIC PROPERTIES AFTER FILM FORMATION IMPURITY ADDITION OR REMOVAL <div style="text-align: center;"> </div>		
(57) Abstract <p>The methods of this invention involve modification of the properties of an organic film after it has been deposited by either adding new components into it from its top or bottom surface, or by causing components to leave the film from its top or bottom surface. In the examples of these methods, the emitting color of light-emitting diodes are modified based on doped polymers by locally introducing dopants causing different color emission into the film by local application of a solution containing the desired dopant to the film surface (by ink jet printing, screen printing, local droplet application, etc.). This overcomes difficulties encountered with the direct patterning of three separately formed organic layers (each which uniformly coats an entire surface when formed) into regions for separate R, G, and B devices due to the sensitivities of the organic materials to chemicals typically used with conventional patterning technologies. Alternatively, dopants may be introduced in an organic film by diffusion from one layer into the film. Alternatively, dopants may be selectively removed from a film with solvents, etc.</p>		